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METIS.

Extract of a Letter from Mr. Graham, 16 *October,* 1850.

"A meridian observation of *Metis*, obtained here on the 11th, has fully confirmed what I had previously good reason to suppose, that my last published elements of the planet are much wider from the truth than the previous ones.

"The observation gives,—

1850.	G.M.T.			R.A.			Decl.		
	h	m	s	h	m	s	°	′	″
Dec. 11	17	9	59·8	9	58	22·72	+18	55	15·0

Corrected for Parallax, not for Aberration.

"This differs nearly 7^s in right ascension, and 23″ in declination from the place deduced from the elements.

"As the observation was satisfactory, I set to work without delay, and have obtained the following set of elements,—

To Mean Equinox of Epoch 1848, May 0·0,

		°	′	″
M	....	144	19	41·25
$\pi - \Omega$	....	2	33	24·33
☊	....	68	27	46·76
i	....	5	35	48·03
φ	....	7	3	27·32
μ''	....	962″.6884		

"These are for the instantaneous ellipse at epoch.

"The places from which these are deduced are the two of 1848, May 15·0, and 1849, Aug. 31·5, previously made use of, and the meridian observation given above, viz.,—

Greenwich M.T.	Long.			Lat.		
	°	′	″	°	′	″
1848, May 15·0	220	37	11·17	+3	26	7·805
1849, Aug. 31·5	327	9	39·75	−9	29	37·54
1850, Dec. 11·70619	145	8	43·65	+6	8	9·11

Corrected for Aberration, and referred to the Mean Equinox of the respective dates.

"Taking into account the perturbations as usual, the residual differences are,—

Observed—Calculated	
In Longitude.	In Latitude.
″	″
−0·29	+0·03
−0·10	+0·04
−0·39	0·00

"The place calculated from these elements differs from the observation of Oct. 21, 1850, by,—

In Longitude.	In Latitude.
″	″
+17·76	−2·24

"I had not much faith in this observation, though taken with all the care I could command; but in default of a better I made the

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most of it, and as it turns out made too much of it. The extraordinary circumstance is, that an error so comparatively trifling should have such an enormous effect on the results; for, so far I can see, those results agree with the places of 1848, May 15; 1849, Aug. 31·5; and 1850, Oct. 21; as closely as 7-figure logarithms would admit of. It may be worth while to examine this subject more narrowly, but I have not leisure at present. It is certainly the most remarkable circumstance that has occurred in the course of my calculations.

"I subjoin the effect of perturbation by the *Earth*, *Mars*, *Jupiter*, and *Saturn*, from 1848, May 0·0, to,—

	δL	$\delta \pi$	$\delta ☊$	δi	$\delta \varphi$	$\delta \mu$
1850.	″	″	″	″	″	″
Dec. 16	−211·07	+145·40	−41·57	−1·984	−120·45	−0·0607
1851.						
Jan. 5	191·39	170·30	42·09	2·017	120·38	0·0773
— 25	165·86	200·26	42·90	2·057	120·16	0·0996
Feb. 14	134·03	235·74	44·06	2·099	119·78	0·1279
Mar. 6	95·69	277·04	45·60	2·139	119·25	0·1625
— 26	50·99	324·24	47·58	2·169	118·57	0·2032
Apr. 15	− 0·20	377·43	50·07	2·183	117·78	0·2499
May 5	+ 56·37	+436·73	−53·12	−2·171	−116·93	−0·3021

CAMBRIDGE. Northumberland Equatoreal. (Prof. Challis.)

	Greenwich M.T.	R.A.	Log. $\frac{p}{P}$	N.P.D.	Log. $\frac{q}{P}$	No. of Comps.	Star.
1850.	h m s	h m s		° ′ ″			
Oct. 21	12 32 5·6	8 58 42·09	−8·638	69 25 30·0	−9·8813	8	(*a*)
29	12 28 28·0	9 11 18·90	−8·633	69 56 12·9	−9·8742	1	(*b*)
Dec. 5	11 51 56·4	9 54 20·27	−8·623	71 9 53·6	−9·8433	7	(*c*)

Assumed *Apparent* Places of the Stars.

	R.A.	N.P.D.	Authority.
	h m s	° ′ ″	
(*a*)	8 55 11·44	69 20 51·8	H.C. $\begin{Bmatrix} 17857 \\ 17861 \end{Bmatrix}$
(*b*)	9 16 19·83	69 34 21·1	B.A.C. 3206
(*c*)	9 55 32·46	71 3 22·8	H.C. $\begin{Bmatrix} 19628 \\ 19629 \end{Bmatrix}$

LIVERPOOL. Equatoreal. (Mr. Hartnup.)

	Greenwich M.T.	R.A.	N.P.D.	Star of Comp.
1850.	h m s	h m s	° ′ ″	
Dec. 5	12 29 59·4	9 54 20·86	71 10 7·6	B.A.C. 3453
	12 50 56·2	21·94	8·5	— —
11	12 34 44·0	58 16·19	4 58·3	— 3506
	12 54 41·8	16·72	56·0	— —
13	12 25 56·8	9 59 20·02	71 1 53·1	— —

The observations are corrected for refraction and parallax: log. Δ for parallax has been taken from Mr. Graham's ephemeris.

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The following are the Assumed *Mean* Places of the Stars of Comparison for 1850·0 :—

	R.A.	N.P.D.	Authority.
	h m s	° ′ ″	
B.A.C. 3453	9 59 8·85	72 30 29·50	Green. 12-year Catalogue.
— 3506	10 8 5·40	71 30 54·24	Edinburgh Observations.

Ephemeris. By Mr. Graham.*

G.M.T.	*True* R.A.	*True* Decl.	Log. Δ.
	h m s	° ′ ″	
Dec. 2·0	9 51 30·63	+ 18 49 56·5	0·2245
7·0	55 19·27	50 55·6	·2109
12·0	9 58 25·71	18 56 3·6	·1974
17·0	10 0 47·39	19 5 53·2	·1840
22·0	2 21·72	19 33·1	·1709
27·0	3 6·12	19 38 6·2	·1583
32·0	10 2 58·44	+ 20 1 6·1	0·1463

FAYE'S COMET.

CAMBRIDGE. Northumberland Equatoreal. (Professor Challis.)

	Greenwich M.T.	R.A.	Log $\frac{p}{P}$	N.P.D.	Log $\frac{q}{P}$	No. of Comps.	Star.
1850.	h m s	h m s		° ′ ″			
Nov. 28	8 40 30·1	21 29 20·38	+ 8·530	97 11 40·1	−9·9161	5	(*a*)
29	7 46 55·4	30 53·72	8·430	97 9 46·7	·9228	8	(*a*)
Dec. 6	6 22 32·7	42 30·93	8·243	96 51 46·6	·9281	4	(*b*)
7	8 0 46·8	21 44 22·33	+ 8·502	96 48 14·7	−9·9177	3	(*c*)

Assumed Apparent Places of the Stars.

	R.A.	N.P.D.	
	h m s	° ′ ″	
(*a*)	21 32 31·80	97 38 54·8	B. (Weisse) xxi. 781
(*b*)	39 45·89	96 36 17·9	— — 937
(*c*)	21 48 15·31	96 32 0·6	H. C. 42725

The R.A. of the star (*b*) in Weisse's catalogue is 1^{m} in defect.

"The observations of the comet were obtained by my assistant Mr. James Breen, by means of the ephemeris published by Lieut. Stratford. On Nov. 28 and 29, the comet was excessively faint, although the sky was perfectly clear. On Dec. 6 and 7, it was seen with difficulty through a slight degree of mist. The mean value of the factor μ in the ephemeris is + 0·272, as given by the observations of R.A., and + 0·288, as given by the observations of N.P.D."

By a more careful comparison, M. Le Verrier finds $\mu = 0·2903$, (see *Comptes Rendus*, Dec. 9, 1850, p. 792), and has furnished the following corrected ephemeris :—

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* Lieutenant Stratford has printed and distributed a more detailed and convenient ephemeris of *Metis*.